Let us talk about (Portuguese) Sign Language Translation!

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Overview

• About Sign Languages
• About the Portuguese Sign Language
• The translation platform
  • Goal
  • Components
• Main Challenges
About Sign Languages

- Sign Languages...
  - ... are natural human languages
  - ... merge manual communication and body language:
    - manual features = different hand shapes, orientation and movement of the hands.
    - non-manual features = body movements (upper torso), facial expressions
About Sign Languages

• Sign Languages...
  • ... have their own vocabulary and grammatical rules

*It is very difficult to take advantage of existing resources when moving to a new sign language!*
About Sign Languages

- Some (possibly accurate) numbers:
  - ~70 million people use a sign language in the world (360 million hearing impaired in the world);
  - ~300 distinct sign languages in the world;
- No official text representation for any sign language.
About Portuguese Sign Language

- Língua Gestual Portuguesa (LGP) is the Portuguese Sign Language
- Official recognized since 1997
- No official number for people using LGP in Portugal
  - The 2011 census mentions 27,659 deaf persons
    - no distinction in the level of deafness, and on the respective level of LGP literacy
About Portuguese Sign Language

- LGP resources:
  - A “grammar” from 1994
  - A dictionary (“gestuário”) from 97 and newer one from 2010
  - The Spreadthesign project
    - [http://www.spreadthesign.com](http://www.spreadthesign.com)
  - ...
  - Recently: online dictionary from Porto Editora
Overview

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- About the Portuguese Sign Language ✔
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The EP2LGP platform: goal

- Develop a free, open source platform, that translates, in real time, (written) European Portuguese (EP) into Portuguese Sign Language (LGP), being the signs produced by an avatar.
The EP2LGP platform: components

- A module for Natural Language Processing
- A module for the avatar
- A module for adding signs
The Natural Language Processing module

- A coelhinha Ana come a cenoura (*little female rabbit Ana eats a carrot*)
  - Tokenizador + Lematizador + POS tagger
  - [(a, art), (coelhinha, nc), (ana, np), (come, v), (a, art), (cenoura, nc)]
  - Named Entity Recognition + Lexical Transfer
  - [(G, coelho + fêmea + pequeno, nc), (FS, ana, np), (G, comer, v), (G, cenoura, nc)]
  - Syntactic Rules
  - [(G, cenoura, nc), (G, coelho + fêmea + pequeno, nc), (FS, ana, np), (G, comer, v)]
The Avatar module

- 57 hand configurations
- Around 15 signs
  - carrot, rabbit, house, female, small, ...
The Avatar module
The EP2LGP platform: components

- A module for Natural Language Processing ✔
- A module for the avatar ✔
- A module for adding signs
A module for adding signs (I)
A module for adding signs (II)
A module for adding signs (II)
A module for adding signs (II)
A module for adding signs (III)
A module for adding signs (IV)

http://vh.cmp.uea.ac.uk/index.php/JASigning
The word “baixo” (short)
The word “noite” (night)
EP2LGP

**Aprenda LGP**
Tire proveito em Língua Natural para Linguagem Gestual Portuguesa utilizando uma interface.

**Crie Novos Gestos**
Utilize o maquinário de coordenadas cartesionas para a criação de novas animações.

**Crie Novos Gestos**
Utilize o maquinário Kinect para a criação de novas animações.

**Visualize Gestos**
Visualize os gestos que criou e transforme-os em arquivos, tendo ainda a inflexibilidade de os eliminar.
Main challenges

- LGP grammar
- How to fasten the insertion of signs in the platform?
  - The crowd is needed!!!!!
- How to improve the available signs?